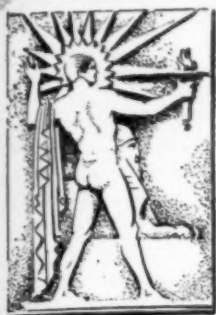


NOV 8 1928



SCIENCE NEWS-LETTER

The Weekly Summary of Current Science
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Nov. 3, 1928



WANT TO FIGHT?

A Mother Owl Defending Her Nest

(See page 268)

Vol. XIV

No. 395

Support for Wegener

Geology
America and Europe once were involved in a geographical entanglement, uncounted millions of years before man, with his contested doctrines regarding political entanglements, appeared on the scene. The two continents broke apart like a worn-out hinge and America drifted westward, allowing the Atlantic ocean to flow between her and her sister continent; but geological reminders are still to be found of the time when the mountain-tops of Scotland might have been seen from the mountain-tops of Canada.

At a recent British scientific meeting, E. B. Bailey of the Scottish Geological Survey told how he has traced the similarity between the old mountain chains of Europe and those of eastern America. The ancient mountains of Scotland, Norway, Ireland and northern England and Wales he calls the Caledonian system, from the classical name of Scotland. He finds these duplicated in the northern Appalachians. The old mountain chain running across central Europe from the Harz mountains of Germany through southern Britain he calls the Hercynian chain, from the classic name of the German mountain forest region. This Hercynian chain he finds repeated in our southern Appalachians. Finally, he finds an American counterpart for the younger Alps in our younger Rocky Mountain system.

Science News-Letter, November 3, 1928

A Belligerent Mother

Ornithology
The photograph on the cover was taken by one of California's leading wild-life photographers, Dr. Joseph Dixon, of the University of California. It shows a female long-eared owl defending her nest—in this case, against the strange, gun-like looking device with which humans take pictures. It was made near Mono Lake, in Mono County, Calif.

But this is the time of year in the east also that the summer birds have gone south, and a new set of feathered boarders begins to move in from the north—including some of the owls, retreating grudgingly before the severity of high-altitude winter, but scornful to fly any farther south than they must. The birds for which our northern states are "south" are almost as numerous and quite as interesting as those that shun the frost altogether and spend only their summers with us.

Science News-Letter, November 3, 1928

Bay Natural Chemical Works

Chemistry

Six billion tons of the commercially useful chemical, Glauber's salt, is made available each year by a natural evaporation plant on the eastern shore of the Caspian Sea. This outdoor chemical factory, built by the sea and operated by the sun, is the shallow, narrow-mouthed Gulf of Kara-Bougaz.

Through its connecting strait, which is only about 800 feet wide, the heavily salted waters of the Caspian flow in a steady torrent, for the higher rate of evaporation in the shallow gulf keeps its level about a foot lower than that of the main body. During the summer the temperature of the water is high enough to keep all the salts in solution, but in winter the water temperature drops to a few degrees above freezing, and according to the well-known laws of solution, the least soluble minerals crystallize out first. In this case the Glauber's salt is the only one that comes out; the others, principally common

salt, sodium sulphate and magnesium chloride, remain in solution.

The Glauber's salt crystals settle on the bottom and are washed ashore by the waves. When they dry, they are picked up by the wind and carried still farther from the water.

The deposit of the salt on the shore begins in the middle of November and continues until the middle of March. Then the temperature rises to a point where the water of the gulf will again dissolve it.

Although the presence of Glauber's salt on the shore of this little visited body of water has been known for a long time, nothing was done toward utilization of the deposits until after the war. Now the Soviet government is undertaking their exploitation.

Glauber's salt is widely used in the dyeing and glassmaking industries, and to a certain extent in medicine.

Science News-Letter, November 3, 1928

In This Issue—

Greatest eye, p. 289—Billions of stars, p. 290—Aerial warfare, p. 271—Invisible wings, p. 273—What is needed, p. 274—Polly a linguist, p. 275—Tigers had tooth-aches, p. 275—Counting crops, p. 275—The new craftsmanship, p. 276—Fish story, p. 277—Aviation vs. psychology, p. 277—How a queen lived, p. 278—Modern voodoo worshippers, p. 278—Books, p. 279—More books, p. 280—Mountain embryology, p. 281—Dead or alive, p. 282.

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All of the resources of Science Service, with its staff of scientific writers and correspondents in centers of research throughout the world, are utilized in the editing of this magazine.

200-Inch Telescope for California

Astronomy

The world's largest telescope, with a concave mirror two hundred inches in diameter, twice that of the greatest existing instrument, will be under construction in southern California within a few months. The funds will be provided by the International Education Board of New York, which administers some of the Rockefeller benefactions.

"The interest of the Board is based chiefly upon the successful cooperation of the Mount Wilson Observatory and the California Institute, and their belief that the provision of additional means of furthering this joint work may lead to many new advances in astronomy, physics and chemistry," it was stated at the California Institute of Technology. "The full cooperation of the Carnegie Institution of Washington, of which the Mt. Wilson Observatory is a branch, has been assured by the unanimous action of President John C. Merriam and the executive committee of the Institution, and by that of Director Walter S. Adams and other members of the Mt. Wilson staff. The research policy of the new Astrophysical Observatory of the California Institute, which will be designed to supplement and not duplicate the Mt. Wilson Observatory, will be determined by a joint committee representing the two institutions, aided by other leading investigators."

Dr. George Ellery Hale, honorary director of the Mt. Wilson Observatory, and chairman of the Observatory Council of the Institute, told of the plans.

"In designing this instrument," he said, "we shall have the collaboration of leading physicists and engineers as well as of astronomers and instrument makers. When the telescope is completed it will be used to extend our present researches in various directions, as in spectrum photography of the stars, direct photography of very faint celestial objects, investigation of the nature of the spiral nebulae or 'island universes' beyond the Milky Way, and in radiometry, or the measurement of the heat from the stars. By making a special study of the various instruments and methods to be used in conjunction with the new telescope for these and other purposes, and by securing the cooperation of the ablest authorities, we expect greatly to increase the effi-

ciency of the telescope.

"The equatorial mounting of the telescope will be designed by a group of experts, including Dr. J. A. Anderson, Dr. Francis G. Pease and other members of the staff of the Mt. Wilson Observatory, working in conjunction with several eminent engineers, opticians and physicists. It is the great mirror, nearly 17 feet in diameter, double that of the largest that has yet been made, that will offer the most difficulty. We expect to make it out of fused quartz, and are much pleased by the cordial and generous offer of cooperation received from President Gerard Swope of the General Electric Company and Dr. Elihu Thomson, director of the Thomson Research Laboratory of this company at West Lynn, Mass. Dr. Thomson is deeply interested in the problem, and has already succeeded in making quartz discs of considerable size. His method is to cast a quartz disc full of fine bubbles and to fuse a layer of very pure quartz, free from bubbles, on the surface, in which to grind the proper dish-shaped figure. Such a mirror behaves as well as a perfectly solid one, and has the advantage of being lighter.

"The great advantage of quartz is that it changes its form so slightly with temperature. With the 100 inch telescope now at Mt. Wilson, we must always be careful to avoid exposing the glass mirror to the heat of the day, and some changes often occur due to differences in temperature at night. With a quartz mirror the effect of temperature is too slight to give any trouble. We feel confident that, by the time we are ready for the mirror, Dr. Thomson will have succeeded in making a quartz disc of the requisite size. Pyrex glass, which is much better than ordinary glass, but not equal to quartz, might be used as a substitute if necessary."

Just how long it will be before the new telescope is in operation, it is at present impossible to tell, but it will doubtless be several years. The plans for the 200 inch telescope have no connection with the project of Prof. George W. Ritchey for a large telescope at the Grand Canyon, in Arizona. Prof. Ritchey has been working in Paris for several years on a method of constructing large telescope mirrors in a cellular

fashion, but it is not planned to employ his method in the 200 inch.

The exact location of the new telescope also remains to be decided. Perhaps it will be placed on Mt. Wilson, 5900 feet altitude, where there would be the advantage of proximity to the other observatory facilities. However, it is possible that the smoke, dust and glare of electric lights from Los Angeles in the future, with the city's increased growth, may prove a disadvantage, especially because of the comparatively short focus of the instrument. Several other sites are therefore being tested in comparison with Mt. Wilson.

The trustees of the California Institute have placed the entire project in the hands of a committee of the Executive Council of the Institute, consisting of Dr. Hale; Dr. Robert A. Millikan, director of the Norman Bridge Laboratory of Physics; Dr. Arthur A. Noyes, director of the Gates Laboratory of Chemistry; and Henry M. Robinson, well-known for his work as a member of the Dawes Commission and in other international undertakings. Dr. John A. Anderson, physicist and astronomer of the Mt. Wilson Observatory, will serve as executive officer of the Observatory Council, in direct charge of design and construction. They will be assisted by an advisory committee including Dr. Walter S. Adams, director of the Mt. Wilson Observatory; Prof. Frederick H. Seares, assistant director; Dr. A. A. Michelson, of the University of Chicago; Dr. Charles G. Abbot, secretary of the Smithsonian Institution; Prof. Henry Norris Russell, of Princeton University; and Profs. Richard C. Tolman, Paul S. Epstein and Ira S. Bowen, of the California Institute. George Eastman, and Dr. C. E. K. Mees, director of his research laboratory, have offered fullest cooperation in the study of special photographic problems. Ambrose Swasey, chairman of the Warner and Swasey Co., Gano Dunn, president of the J. G. White Engineering Co., and recently chairman of the National Research Council; Dr. Frank E. Ross, of the Yerkes Observatory, and others equally well-known, will aid in the work of design, and many other scientists especially qualified will contribute useful suggestions.

What The New Telescope Will Do

Astronomy

About a half billion stars, that cannot now be seen or photographed with any telescope, as well as thousands of inconceivably remote nebulae, will be within the reach of astronomers when the new 200-inch telescope, of the California Institute of Technology, at Pasadena, is completed. But astronomers are not interested merely in great numbers, and that alone would not justify the millions of dollars that will be spent on the great instrument.

The closer and brighter things that will be seen better are what particularly interest the astronomer, and which will occupy most of the attention of the new telescope. But even some of these would have been thought impossible far only a few years ago. For instance, there are the spiral nebulae. Thousands of these have been observed in the sky, all with the characteristic spiral structures more or less evident. For years their nature was subject of dispute until Dr. Edwin P. Hubble, of the Mt. Wilson Observatory, with photographs made with the 100-inch telescope, still the world's largest, definitely showed what they are. His photographs revealed the individual stars of which they are constituted. They showed that these nebulae are system of stars like that of which the Milky Way, and all the stars that we can see, including the sun, are part. Dr. Hubble also measured the distances of two of these nebulae and showed that they are independent systems of this kind—far beyond the limits of our own. These are known to astronomers as Messier 31 and Messier 33, after their numbers in one of the first catalogs of such objects.

Two spiral nebulae, out of the thousands that are shown, do not form a very large proportion, although there is plenty of evidence that the two studied are rather typical of the group. Astronomers have been anxious to observe more nebulae, and they also wish to observe the two even better.

The 200-inch telescope will do this. Perhaps a half dozen or so nebulae, that now appear as continuous areas of light, will be resolved into their constituent stars. If this is done, their distance can be measured.

Some distant spiral nebulae, now invisible, undoubtedly will come into view. The farthest now within reach

of the 100-inch are something like 840 million million miles away—so far that their light takes 140 million years to reach us. With the new telescope thousands beyond will be visible, the farthest of them being nearly five thousand million million, or five sextillion, miles from us. And when they are seen, the light exposing the photographic plates, will have been on its way for a thousand million years—since a time long before man appeared on the earth, and when the planet itself was still young.

Though perhaps the most sensational work of the new telescope, even the observations of the spiral nebulae will not constitute the only work of the instrument. Most of our present-day knowledge of stars has come from study of their spectra, obtained when their light is broken up into the constituent colors. The light from a star, that would fall on a single point of the photographic plate, must be spread out in making a spectrum photograph. Therefore, it is not possible to make such studies of many stars that can now easily be seen directly. The new telescope will permit of far more powerful spectroscopes than any that can now be brought to bear on the stars.

Another field for the 200-inch telescope will be in the members of the solar system. As it is planned to make the mirror of quartz, which will not expand distortingly under the sun's rays, it will be possible to use it for observations of the sun. The planets will be brought almost to within hailing distance, and some of the present day mysteries concerning Mars, Jupiter, and the other planets may be solved.

In deciding on a telescope with a mirror 200 inches in diameter, the astronomers are making the greatest jump in size since Isaac Newton invented the reflecting telescope. It was in 1672 that, in order to overcome the defects that were then inherent in refracting telescopes, in which the light rays were brought to a focus by a glass lens, he made the first reflector. Here, a dish-shaped mirror reflected the rays back towards the object, and at the same time brought them to a focus. A second, and flat, mirror, reflected the rays to the side, where the observer could see the image, without getting his head in the way. Newton's

original reflector, with a mirror only two inches in diameter, is still in the possession of the Royal Society in London. In 1723 the astronomer Hadley showed the proper curves that should be given to the mirror to give the best images, and from then on, large reflectors became possible.

Before 1800 Sir William Herschel began to make large reflecting telescopes, finally building one with a mirror 48 inches across. Then an Irish nobleman, the Earl of Rosse, began to make them, and actually made one about 1845 with a 60-inch mirror, which was only exceeded in size in 1919, at the time the 72-inch at Victoria, B. C., was completed. Long before this, however, smaller instruments had passed the Earl of Rosse's in quality of performance. A 60-inch, of the very finest construction, had been completed at Mt. Wilson in 1906, and is still in regular use. Then came the 100-inch. Delayed by the war, this was finished in 1920. And now the Mt. Wilson Observatory will cooperate with the California Institute in building the 200-inch, and in a few years the biggest jump of all will have been made.

Science News-Letter, November 9, 1928

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Fight Forest Fires With Planes

Forestry—Aviation



A GREAT FOREST FIRE SEEN FROM AN AIRPLANE

(Official photo, U. S. Forest Service)

By JAMES NEVIN MILLER

High above a blazing fire on one of our great national forests in the northwest, an airplane circled and sped not long ago. For miles around, curling clouds of blue-gray smoke filled the atmosphere, while down on the ground large squads of fire fighters fought their way through acres of fast-burning timber.

As the plane flew above his head, one of the forest rangers, directing ground operations, paused a fraction of a moment to watch its maneuvers. Almost simultaneously a slight whirring sound caught his ear, and then, crashing through a nearby thicket, he saw a small object fall. It was a canvas bag, and within it was a message. Knowing that the ground men were severely handicapped by the stifling smoke, the plane observer, likewise a ranger, was now offering to aid the operations. His advice, relating to a change in position, was taken, and soon the fire was well under control.

The above incident is typical of the efficiency of the new airplane patrol system just inaugurated by the U. S. Forest Service. For about nine years the Service has been experimenting with planes under the able guidance and cooperation of the Army Air Corps. Until this summer the planes, old-type de Havillands, were piloted by Air Corps officers temporarily in the employ of the Forest Service and accompanied by forest officers acting as observers. The main bases were

at Mather Field, near Sacramento; at Glendale, near Los Angeles; and at Seattle and Spokane, Washington. The national forests patrolled were in California, Oregon, Washington, Northern Idaho and Western Montana.

Today, however, the patrol system is entirely free from the cooperative arrangement with the Air Corps. Early this spring authorities from the Aeronautics Branch of the Commerce Department, the Forest Service and the Air Corps, unanimously agreed that from now on the wisest procedure would be to hire both planes and pilots from commercial interests. Each forest district hereafter will make its own contracts according to its peculiar needs, and the planes, of the most modern type, will have a considerably better cruising power.

Of the new system, Roy H. Headley, assistant forester of the Forest Service, says: "After years of extensive tests the Service is convinced that the science of fighting forest fires from the air has great possibilities. We have been only too glad to work under the kindly supervision of the Air Corps. But having now served our apprenticeship, we feel ready to paddle our own canoe. Contracting each year with the commercial aircraft people will undoubtedly mean that we shall be better able to take advantage of the very latest aviation developments.

"Of course, the Air Corps has by

no means stepped entirely out of the picture. The body will continue to help us materially in an advisory capacity, as will the Aeronautics branch of the Commerce Department."

During the early years of experimentation with the air patrol, regular flights were made over our heavily timbered areas. But by 1921 it was declared that "in view of previous experience, desirable as they might be, regular flights are not justified by the degree of protection they afford as compared with that afforded by the lookouts stationed on most of the sizable mountain peaks." It was therefore arranged to have planes at intervals of a few hundred miles held ready for emergency flights. Such has been the plan followed up to this summer.

In order to really understand the role of the new air patrol in fire-fighting maneuvers, one needs a general idea of the regulation personnel. First of all there are the lookouts. Stationed at strategic points on most of the high mountain peaks, their sole duty is to watch for fires and to telephone their location immediately to the forest rangers or wardens. From daylight to night, from early summer to early fall the lookout men remain constantly on duty.

The lookouts occupy small buildings or observatories with windows on all sides. Some observatories are set on steel towers, 30 to 80 feet above the ground, while (Turn to next page)

Aerial Warfare on Forest Fires—Continued

others are set on the mountain peaks. Cooperating with the lookouts proper are fire guards or patrolmen who travel along the ridges and other high routes which provide a good view of areas where fires are likely to occur.

Ranger stations likewise are scattered throughout the mountains. The rangers are the executive fire fighters. When the report of a fire is received, the ranger or one of his assistants may go it alone if the blaze is small. But if it is reported as large, a considerable number of men with fire-fighting tools is gathered together and sent to the scene of the blaze as rapidly as possible.

One of the main uses of the plane today relates to the reconnaissance of large fires. In certain portions of our heavily timbered regions it is extremely difficult for the ground men in charge to visualize the situation readily. However, again and again the plane has proved its worth in this regard. A notable instance took place back in 1924 in the great Southern California fire, where 50,000 acres of valuable timber land were consumed. The situation was complicated by the rough topography and the unusually inflammable brush, widespread and thick. When a violent wind arose, a long stretch of timber soon would become ignited. Oftentimes the boiling, smoke-drenched atmosphere prevented the ground observers from seeing more than a few paces in front of them. So the men in charge tried out the scheme of making daily observations by air-plane. Signal success resulted.

In forests carefully guarded from fires caused by man's carelessness, there exists always the hazard of fires started by lightning. Various estimates hold that 40 to 50 per cent of our great conflagrations arise from this source. At any rate, lightning fires are unquestionably the most severe in point of damage done. Experts say the reason is that lightning is likely to start fires in inaccessible spots where they will not be discovered promptly by the lookouts. Here again the airplane assumes an important role. Under its new system the Forest Service is developing a scheme whereby after every sizable lightning storm a plane will make a complete tour of the district, forever on the alert for smoldering fires which frequently arise in widely separated sections of the forest.

Considerable experimentation is being done concerning the carrying of

messages by plane, besides its use in dropping food and supplies on the fire lines. Here the plane offers excellent potentialities because there are many thickly timbered regions in our national forests which either are virtually inaccessible by land, or take many days to penetrate. Frequently the trails are few and far between, while there are sections where there are no passage-ways of any description whatsoever.

To force his way painstakingly through these densely wooded districts with a forty-pound pack on his back is the task of the fire-fighter. Therefore, many experts urge the extensive use of the plane in this regard. Yet there is a besetting difficulty in the way, according to Assistant Forester Headley. The government is not yet sure whether in the long run the air transportation system, costing something like \$30 an hour, is more economical than the ground method. Probably it would be so, were there proper landing places for the planes. But today in the mountainous regions of rough topography and dense forests it usually is well-nigh impossible to land a plane within a few hundred miles, at the least, of its base.

In explaining the government attitude, Assistant Forester Headley says: "While it is obviously desirable to have good landing fields for the air patrol, probably an even more important problem just now is to continue the government plan to construct more and better trails. For the purpose, thousands of men are drafted annually to be employed in the West and Northwest. Eventually a well-devised network of simple yet inexpensive trails will be in evidence throughout our great timber stretches. We hope that when that happy time arrives, no point in the woods will be inaccessible.

"One other point the Forest Service endeavors to make clear that with all their advantages, planes will never be able to replace the operations of the men on the ground. Air maneuvers are supplementary only. However, the Forest Service always is striving to bring them up to the maximum of efficiency."

Science News-Letter, November 3, 1928

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Silent, Invisible Airplanes Soon

Aviation

Airplanes that will be silent as they move through the air and practically invisible from the ground, may be one of the next steps in aviation. Already remarkable progress is being made in experiments conducted on behalf of various European governments. France, England, Russia and Germany are said to be conducting such researches.

The silencing of the aero-engines is in many ways the simplest of the problems, but immediately that any mechanism is employed which reduces engine noise there are other sounds which begin to make themselves apparent, the high-pitched notes set up by rapidly revolving air screw or screws.

To cope with these propeller noises is more difficult than to quiet the engines. One way, however, in which this particular problem is being approached is illustrated by experiments now in progress.

Instead of using an ordinary two or four-bladed propeller, tests are being made with screws having six or more blades of rather a small size. These blades—embodying a very large amount of laboratory work—are designed and shaped specially with a view to lessening the noise they make when in rapid motion.

It is probable that before long secret demonstrations, which are already being discussed, will be conducted with large airplanes equipped with silenced engines and "noise-

less" types of multi-bladed metal air screws; and the sounds these machines make as they rush through the air will be further reduced by the elimination of external wires and friction producing projections.

A more immediately practical field of research, and one almost equally fascinating, lies in the progress which is being made with "invisible" paints or dopes.

In England the authorities have evolved a queer, dark dope of a dull, greenish hue. This not only makes a big machine elusive to sight when moving against a background of cloud, but it is also the color which has been found least conspicuous when a high-flying machine comes into the rays of searchlights directed on it from the ground.

A problem even more complex than those already mentioned is now reported to be under investigation in certain German laboratories. This deals with the reduction and, if possible, with the elimination of tell-tale shadows.

Recently German designers and builders have accomplished remarkable strides in the production of giant metal monoplanes simplified in construction so as to offer a minimum of resistance to their own progress through the air.

Such huge craft have their motors sunk in a big single wing projecting on either side of the streamlined hull, and when they are flying immediately towards any observer viewing them

from the ground these very large machines, widespread though their wing span is, present an astonishingly small object to the eye.

But when such a machine, as it is flying, passes overhead until it is in a position almost directly above, the eye is attracted by dark all-revealing shadows which are formed and held under the lower surface of the large curved wing. It is these shadows under the wing, rather than the wing itself, which draw one's attention to the machine.

One of the lines of research which, it is understood, is being followed in German laboratories, and also at certain Russian experimental stations, is to devise special means whereby, owing to secret treatment of plane-surfaces and adjacent parts, heavy shadows are so distributed and broken up that, when viewed from below, they no longer reveal so plainly the shape and size of a wing.

In many respects such aerial researches are the most significant—and also the most sinister—ever undertaken. The evolution of a machine which will rush through the air unseen and almost unheard has possibilities which are practically illimitable.

Used as a weapon of war, its horrors would be almost unspeakable. It would represent in stark, terrible reality that silent and invisible death which writers of fiction have so often described.

Science News-Letter, November 3, 1928

Strange Stone Age Burial

Archæology

An extraordinary prehistoric burial, unlike others of the southwest and resembling the practices of some ancient Roman tribes, is one of the discoveries reported by the archæological expedition sent out this fall by the University of New Mexico and the School of American Research.

The expedition under the direction of Dr. Edgar L. Hewett, of the University of New Mexico, has been investigating the site of the ruined pueblo of Ungshage, 40 miles northwest of Santa Fe, in order to advance the knowledge of the ancient people whose history is buried in the ruins of this region. More than a score of large ruins are located very near together, yet almost nothing beyond the fact of their existence is known about them.

A large number of skeletons, most of them well preserved, were taken from the rubbish heaps of the pueblo, which had served as burial places. The customary pueblo method of burying the individual in a curled-up sitting position was generally followed, and each grave contained pottery which had been broken or "killed" to allow the life spirit to escape.

One body found under the floor of a room was buried full length, however, and sealed over with a mound of clay. This manner of burial is believed to be unique in southwestern archæology. The bones of this individual were slighter than those of other skeletons in the ruin, and the teeth were perfect, whereas teeth of the other individuals were worn down to the pulp from

eating corn meal containing grit. The bones will be especially studied to see whether this individual belonged to the group, or whether he was a stranger.

Pottery, flint and bone weapons, household implements, and fetishes found in the ruin all point to a Stone Age culture, untouched by any European influence, the archæologists conclude. This region was a scene of many important historic events in early Spanish colonial times. Much of the plotting of the Pueblo Revolt in 1680, resulting in complete expulsion of the Spanish conquerors from New Mexico for a time, occurred here. But this pueblo had evidently been abandoned long before these events, possibly because of a scarcity of good agricultural land nearby.

Science News-Letter, November 3, 1928

A Goal for Eugenics

Eugenics

WALTER B. PITKIN in *The Twilight of the American Mind* (Simon and Schuster):

By all odds, the most important human type, the one which must be multiplied on the largest scale under present conditions of civilized life is the thoroughly healthy man. And when I speak of health, I refer equally to health of body and health of mind—which are pretty nearly the same thing. Health is a matter of organic stability, a condition which enables us to recover easily from wounds and infections and to go about the day's work without strain or worry or quick fatigue. On the mental side it is revealed in simple sanity and steadiness of temper. Always its mark is a quick return to normal after a shock, and the normal here is always a fairly pleasant and active manner of living.

Next to an improvement in health types, we need a great increase in the relative number of people blessed with high energy. This is something over and above mere health. Millions of healthy people are not very energetic. I have observed, in my own psychological practice, that some of the very healthiest varieties go through life doing very little work of any sort; and what little they do is performed for bread and butter's sake. In a word, healthy but lazy! On the other hand, some of the most energetic people I know are not wholly well; they have a wonderful fund of vital power to draw on, but many things upset them and leave them in an unsettled state of physical or psychic debility. Some of the world's noblest achievements have been the products of half-sick men and women. The ideal, of course, is to link this flow of free available energy to a healthy body. But as yet nobody knows quite how to accomplish this. Some day, though, our eugenic research workers will discover which human stocks possess such energy as a dominant trait; and then it will be easy to advise people how to energize their descendants. For that fair day we shall probably have to wait a millennium or two. But what's a millennium between eugenists?

Finally there seems to be a genuine need for a larger relative number of people endowed with keener sensitivities than the run of mankind. Whether the senses of the race have or have not deteriorated since man began dwelling in cities is a question into

which we need not go; for it does not bear on the issue at hand. This much seems fairly certain, on the basis of extensive observations by many specialists: defective vision is almost universal; partial deafness is increasing generally; the sense of smell begins to degenerate in early childhood, if not in infancy; and the esthetic sensitivities of most people are very crude indeed, as is reflected more or less by the mania for violent noises and rhythms, as well as for extravagant forms and colors in design and in dress. Whatever the causes of this may be—and I have no idea what they are—the inferior sensitivities are eugenically bad, though not for the obvious reasons that make ill-health bad. Low sensitivity robs the ordinary man of a world of innocent pleasures which, if once possessed and tasted, would enrich his existence. And in the second place, low sensitivity makes him indifferent to a host of evils in his environment against which he ought to rise up in wrath. A race of degenerates who could neither smell nor taste would never resent heaps of

garbage and manure around their doorsteps; hence the only way they could ever protect themselves against the infections lurking in decay would be by the application of the highest order of scientific curiosity and experimentation. But this is so rare that, as probably has happened a thousand times in the past million years, whole races might well be exterminated through sheer lack of eye, ear, tongue or nose keenness. For, barring pure accident in discovery, there are only two ways of finding and correcting the evil: one is by being disturbed and incommoded by some phase of the evil and thus being aroused to fight it, and the other is by sheer inquisitiveness. He who is both insensitive and incurious has a slim chance of great-grandchildren, unless somebody else comes to his rescue with sensitivity or curiosity. And then he survives only as a parasite, becoming a menace to the superior types.

Science News-Letter, November 3, 1928

Fall is the best time of year to seed lawns.



WHAT PRICE KNOWLEDGE?

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Census of Agriculture Planned

Agriculture

Plans for the first international census of agriculture ever taken, are practically complete, according to Leon M. Estabrook, director of the census, who recently visited Washington to make arrangements for the work in the United States.

The census will be conducted in over 200 countries under the auspices of the International Institute of Agriculture at Rome. The figures to be compiled will give the number and size of farms, the area and production of important crops, and the number of each kind of livestock by age and sex classifications, for every farm in the countries cooperating. The census will be taken during 1929 and 1930 and the results are expected to be compiled and published in 1931 or 1932.

Each country will take the census with its own organization and methods, following a standard form furnished by the Institute of Agriculture.

The countries which have already agreed to cooperate include 90 per

cent of the surface of the globe, 95 per cent of its population, and about 98 per cent of the agriculture of the world, according to Mr. Estabrook.

The purpose of the world agriculture and livestock census as stated by the director, "is to obtain more complete data regarding agriculture throughout the world than has ever been collected before. The need for such data has been felt, especially since the war, by all statisticians and economists."

According to figures compiled by the Institute, only 60 of the 200 countries listed have ever taken an agriculture census, and of these fewer than 40 have had a census since 1900. In all but three or four cases the figures were taken in different years so as to be of little comparative value.

Mr. Estabrook has been loaned to the Institute by the United States Department of Agriculture. He was formerly chairman of the crop reporting board of the department.

Science News-Letter, November 3, 1928

Saber-Tooth Toothaches!

Paleontology

Studies now being carried on at the Los Angeles Museum show that the saber-tooth tiger traditionally associated with the struggles of early man, had tooth disturbances, which they bore without the benefits of painless dentistry.

More than a thousand jaws of this mighty feline are in the possession of the museum, and some thirty observations are being made on each jaw. A difficulty in the work is that so many teeth dropped out after the animals left their bones in the asphalt pits, at Rancho la Brea. Scarcely a half-dozen jaws in the whole thousand possess full complements of teeth.

Caries, or tooth cavities, have not been found in the saber-tooth jaw, although there are many jaws where the teeth are greatly worn. Pyorrhea is probably present, but rare. Impaction, the bane of modern human "wisdom-tooth" sufferers, is clearly shown in jaws of the saber-tooth. Alveolar abscesses show clearly in some of the X-rays.

Dead teeth are known in which the root-canal is filled in. The root itself becomes bulbous, and acquires excessive growths, as in human teeth. The dead teeth are always blackened.

Science News-Letter, November 3, 1928

Pueblos Got Few Vitamins

Anthropology—Medicine

The cliff dwellers who lived in the canyons of the southwest in prehistoric times never heard of vitamins and fresh air, but a lack of these undreamed-of necessities was a main cause of their downfall. This is the theory presented by Dr. Walter Hough of the Smithsonian Institution.

The decay of a race is one of the great problems of the world, Dr. Hough showed. The reasons for the passing of ancient cities and tribes may point a valuable and timely warning to modern civilizations.

A study of the food supply of the pueblos was made in order to see whether it would account for the mysterious dwindling of the pueblos beginning about one thousand A. D., long before the white men disturbed their country. Corn was their great food, and their diet was about eighty-five per cent grain, the rest being meat and vegetables. The ration was adequate for sturdy adults, but in winter the diet must have lacked in fat and vitamins, and the children suffered, the scientist stated. Lack of fuel must have caused insanitary huddling in dark rooms of the pueblo in winter.

"Infant mortality was probably an important cause of the decrease of population," Dr. Hough concluded.

Science News-Letter, November 3, 1928

Goods for Ultra-Violet

Physics

The health-giving ultra-violet rays of sunlight, which everybody wants nowadays, pass through cotton, linen and rayon fabrics about equally well when these are of equal weight and closeness of weave. Fresh, white, natural silk is almost as transparent toward the rays as bleached cotton, while wool is only about half as transparent.

These are some of the results obtained in a study of the transmission of ultra-violet radiation through various fabrics, conducted at the U. S. Bureau of Standards by Dr. W. W. Coblenz, Dr. R. Stair and Dr. C. W. Schoffstall, and reported in the Bureau's new *Journal of Research*.

"In all cases when the fabric is dyed, or slightly yellowed with age, the ultra-violet transmission through the thread is greatly decreased," the investigators state. "Hence, as is to be expected in comparing various kinds of dyed fabrics, the one having the largest openings between the threads transmits the most ultra-violet."

Science News-Letter, November 3, 1928

Soap Explosion Hazard

Physics

Soap flakes and soap powders, being extremely explosive, take their place as the latest industrial hazard. Certain kinds of soap dusts when suspended in air are more violently explosive than most other industrial dusts, according to tests made at the Pittsburgh experiment station of the U. S. Bureau of Mines. These soap dusts are easily ignited and explode violently, accompanied by much flame and large quantities of heat. This is in spite of the fact that soap is a compound of semi-organic nature and that sodium compounds in general have a cooling effect on the flames of explosives.

Science News-Letter, November 3, 1928

Spanish Easy for Parrots

Comparative Psychology

Parrots learn the Spanish language more easily than English or German, dealers in birds and other pets in the Southwest declare. Species of parrots from the tropics that are brought here when young are said to acquire the habit of saying the soft words of the Spanish language quicker than the rather harsh words common to the Teutonic languages. In the bird house at the Dallas municipal zoo a parrot speaks Spanish words picked up from countless Mexican visitors and has never spoken a word in English.

Science News-Letter, November 3, 1928

Science and Craftsmanship

General Science

SIR WILLIAM BRAGG, K. B. E., F. R. S., in his presidential address before the Glasgow meeting of the British Association for the Advancement of Science:

There are even some who think that science is inhuman. They speak or write as if students of modern science would destroy reverence and faith. I do not know how that can be said of the student who stands daily in the presence of what seems to him to be infinite. Let us look at this point a little more closely.

The growth of knowledge never makes an old craft seem poor and negligible. On the contrary, it often happens that under new light it grows in our interest and respect. Science lives on experiment; and if a tool or a process has gradually taken shape from the experience of centuries, science seizes on the results as those of an experiment of special value. She is not so foolish as to throw away that in which the slowly gathered wisdom of ages is stored. In this she is a conservative of conservatives.

What is true of a tool or process is true also of those formulas in which growing science has tried to describe her discoveries. A new discovery seems at first sight to make an old hypothesis or definition become obsolete. The words cannot be stretched to cover a wider meaning. By no means, however, is that which is old to be thrown away; it has been the best possible attempt to express what was understood at the time when it was formed. The new is to be preferred for its better ability to contain the results of a wider experience. But in its time it will also be put aside. It is by a series of successive steps that we approach the truth; each step reached with the help of that which preceded it.

Nothing in the progress of science, and more particularly of modern science, is so impressive as the growing appreciation of the immensity of what awaits discovery, and the contrasted feebleness of our ability to put into words even so much as we already dimly apprehend. Let me take an example from the world of the physical sciences. There is a problem of which the minds of physicists have been full in recent years. The nineteenth century theory of radiation asks us to look on light as a series of waves in an all-pervading ether. The theory has been marvelously successful, and

the great advances of nineteenth-century physics were largely based upon it. It can satisfy the fundamental test of all theories, for it can predict the occurrence of effects which can be tested by experiment and found to be correct. There is no question of its truth in the ordinary sense.

In the last twenty or thirty years a vast new field of optical research has been opened up, and among the curious things we have found is the fact that light has the properties of a stream of very minute particles. Only on that hypothesis can many experimental facts be explained. A wave theory is of no use in the newer field. How are the two views to be reconciled? How can anything be at once a wave and a particle? I do not believe that I am unjust to any existing thinker if I say that no one yet has bridged the gap. Some of you who were present at the Liverpool meeting may remember that Bohr—one of the leading physicists of the world—doubted if the human mind was yet sufficiently developed to the stage in which it would be able to grasp the whole explanation. It may be a step forward to say, as we have been saying vaguely for some years, that both theories are true that there are corpuscles and there are waves and that the former are actually responsible for the transference of energy in light and heat, and for making us see; while the latter guide the former on their way. This is going back to Newton, who expressed ideas of this kind in his "Opticks," though he was careful to add that they were no more than a suggestion.

We are here face to face with a strange problem. We know that there must be a reconciliation of our contradictory experiments; it is surely our conceptions of the truth which are at fault, though each conception seems valid and proved. There must be a truth which is greater than any of our descriptions of it. Here is an actual case where the human mind is brought face to face with its own defects. What can we do? What do we do? As physicists we use either hypothesis according to the range of experiences that we wish to consider. To repeat a phrase which I employed a few years ago in addressing a university audience familiar with lecture time-tables, on Mondays, Wednesdays and Fridays we adopt the one hypothesis, on Tuesdays, Thursdays and

Saturdays the other. We know that we cannot be seeing clearly and fully in either case, but are perfectly content to work and wait for the complete understanding.

And when we look back over the two centuries or so during which scientific men have tried systematically to solve the riddle of light, or even go farther back to the surmises of philosophers of still older time, we see that every conscientious attempt has made some approach to the goal. The theories of one time are supplanted by those of a succeeding time, and those again yield to something more like the first. But it is no idle series of changes, no vagaries of whimsical fashion; it is growth. The older never becomes invalid, and the new respects the old because that is the case.

Surely, it is the same in regard to less material affairs. The scientific worker is the last man in the world to throw away hastily an old faith or convention or to think that discovery must bring contempt on tradition.

Science News-Letter, November 3, 1928

Aristocratic Utopias

Philosophy

Sir PHILIP GIBBS, in *The Day After Tomorrow* (Doubleday, Doran):

Mr. H. G. Wells, the only prophet of modern times who has actually seen some of his prophecies fulfilled—generally of a most unpleasant kind, like tanks and bombing aeroplanes—seems to have lost his faith in the advance of democracy to a flower-Strewn Utopia with Men like Gods, and in his recent work suggests that human progress can only be attained by an intellectual aristocracy of very rich men, remarkably like Sir Alfred Mond, who will create enormous trusts, discipline the lower classes, and create a new heaven on earth by scientific organization and divinely inspired committee meetings.

Science News-Letter, November 3, 1928

Christmas Cards OF WOOD

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48 Lines Radiovision Standard

Radiovision

Radiovision pictures of the future will be made of 48 lines, with 15 separate frames, or pictures, every second, if the decision of the Radio Manufacturers' Association on standards is followed. A sub-committee of the Association's committee on engineering, with Dr. D. E. Replogle as chairman, recently met in Chicago with representatives of the leading manufacturers, and others interested in radiovision, including C. Francis Jenkins, of Washington.

Although there are still only a few radiovision broadcasters, compared with the sound broadcasters, they have been employing a variety of methods. The committee adopted as standard the system used by C.

Francis Jenkins in broadcasting movies from his station in Washington. This makes use of 48 lines in the scanning disc, arranged so that the lines follow each other from top to bottom, and left to right consecutively, like lines of type on a printed page. The committee also adopted the use of the word "frame" as referring to a single picture area.

It is expected that all the television broadcasters will now adopt these standards, so that one radiovision receiver with one scanning disc will be able to receive any radiovision broadcasts.

Science News-Letter, November 3, 1928

Dr. Eckener, Psychologist

Psychology—Aviation

Dr. Hugo Eckener, commander of the Graf Zeppelin, obtained his doctor's degree in a field quite removed from aviation, it was revealed by Dr. Lightner Witmer, director of the Psychological Laboratory and Clinic at the University of Pennsylvania. Dr. Eckener was a student in psychology at the University of Leipzig, under the famous Prof. Wilhelm Wundt, at the same time as Dr. Witmer. In 1892 Dr. Eckener received his degree, but he remained at the university, and when Dr. Witmer received his degree a year later, it was for a piece of research for which Dr. Eckener had acted as subject.

Failure in obtaining a position in psychology led Dr. Eckener into the work for which he is now internationally famous. No jobs were open, even though he wrote Dr. Witmer later to see if there was an opening in America. As an alternative, he got into newspaper work. In the early days of Count Zeppelin's experiments, he wrote a scathing article condemning the whole lighter-than-air proposition. Zeppelin protested that Eckener knew nothing about it, but invited him to visit his works and learn more. As a result of this visit the air-ship builder and the erstwhile psychologist became close friends, and eventually Eckener became Zeppelin's assistant.

Science News-Letter, November 3, 1928

The great agricultural census to be taken in 1930 will represent about 98 per cent. of the agriculture of the world.

Explosions Tell Air Secrets

Physics

Explosions made by big guns when they are fired have proven that the air is warm at a height of 25 miles above the earth's surface. Major W. S. Tucker, reading a paper by F. J. W. Whipple, told at the recent meeting of the British Association for the Advancement of Science how a sensitive electrical device, developed during the war for determining the distance of enemy guns, had been used for studying the propagation of air waves. The principle was this: if a fine wire carries an electric current, it is heated. Then, if the wire is cooled, as by a puff of cold air, the resistance of the wire is raised, and the change in current can be detected. The sound wave from the gun acted as the puff of cold air, and so by observing the time of arrival of the sound at different places, the distance of the gun could be quickly calculated.

Mr. Whipple, using the same device, has found out that the sound of a big gun behaves something like short radio waves. Close to the gun it can be heard, farther away it is inaudible, but still farther it can once more be heard. This is the result of the warm layer of air, about 25 miles up, bending the sound waves to earth again. People close to the gun hear the direct wave, those far away hear the reflected one. These experiments confirm ideas of other scientists gained from study of the behavior of meteors, or "shooting stars" as they near the earth.

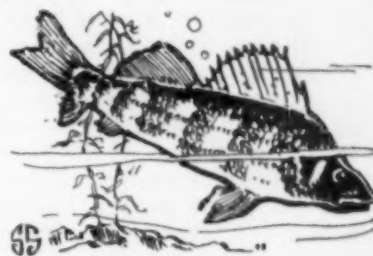
Science News-Letter, November 3, 1928

Japan's land area is about that of the state of Montana.

NATURE RAMBLINGS

By FRANK THONE

Natural History



Yellow Perch

"I pray you, sir, give me some observations and directions concerning the *Pearch*, for they say he is both a very good and bold-biting fish, and I would fain learne to fish for him."

Thus the disciple to the Master of all Fishermen, the great Izaak. And the ways of the perch are well worth learning, though he be no bass or trout, for he puts up enough of a fight to give an experienced fisherman a mild thrill, and when he comes to the table he can hold up his head and tail on the platter with the most aristocratic of them. Jordan and Evermann say of him, "As a pan-fish we do not know of any better among American freshwater fishes. We have experimented with the yellow perch and several other species, including both species of black bass, the blue-gill, wall-eyed pike, and rock-bass, eating each for several days in succession, and found the yellow perch the sweetest and most delicious of them all. One does not tire of it so soon as of the other kinds."

The yellow perch is for choice a lake fish, abounding in the smaller waters of the northern states; but it is found also in streams as far south as North Carolina. It bites readily the year round, on almost any kind of bait, and will on occasion even take an artificial lure. It can be fished for through the ice in winter, when it goes most readily after minnow bait.

The yellow perch never reaches really large size; a two-pounder is to be rated as pretty big, and most specimens do not run much over half that. But it is an economical fish, not wasting much weight on head and tail and other inedible parts, so that even perch of less than a pound are well worth taking home.

Science News-Letter, November 3, 1928

A Queen's Life

Archæology

GEORGE A. REISNER in *Bulletin of the Museum of Fine Arts* (Museum of Fine Arts, Boston):

In closing this preliminary report (on the discoveries at Giza in the tomb of the Egyptian Queen Hetepheres I, mother of Cheops and wife of Sneferuw), I call attention once more to the significance of the material from the secret tomb of Hetepheres I. The canopy, the bed, and the curtain box were given to the queen by Sneferuw. Cheops may have been born on that bed. He it was who gave the carrying-chair and most of the other gold-cased furniture. The toilet boxes and implements, the silver anklets, and most of the vessels had been used by the queen "while alive on earth." In those days when Hetepheres lived in the palace of Sneferuw, Egypt and its monuments presented an appearance very different from that seen by the modern traveler. The queen was a witness of the building of the pyramid of Medum, made perhaps for her father, and that of her husband at Dahshur—monuments seldom visited by the layman. She must have visited the ever-famous temples of the Step Pyramid at Saqqarah built for King Zoser of Dynasty III by Imhotep, the greatest of Egyptian architects. That great complex is still in course of excavation by Mr. C. M. Firth for the Egyptian Government, and has not yet caught the attention of the public. It appears to have been the earliest building of dressed stone in Egypt and served as the inspiration of all the great temples and pyramids at Giza. In the lifetime of Hetepheres I, men were still conscious of the temples of Zoser as something new and wonderful. She saw the pyramid plateau at Giza as a bare dome of rock, a part of the desert thrusting forward into the black fields; and before she died she saw the pyramid of her son rising on that rock. But none of the other familiar pyramids of Giza, Abu Roash, or Abusir, had been conceived nor had the Great Sphinx taken form in the imagination of her grandson Chephren, whose features are portrayed in its face. The queen may have visited great temples of the gods at Memphis and Heliopolis, but they do not exist today; for they were overbuilt ages ago or now lie as hidden ruins under obscure mounds of earth. All the great temples of Upper Egypt, and even the world-famous tombs of Giza and Saqqarah, which the traveler sees, were

Voodoo Worship Vs. Science

General Science

PROF. E. M. EAST, in the *Journal of Heredity*:

Librarians and publishers are agog over the increased quantity of serious reading done by the American public. According to report, instructive books covering many different phases of learning are giving a battle to the lighter forms of literature. This is interesting, if true. Personally, I am a pessimist—at least as regards science. Out of some fifty books for the general public purporting to be psychology that I have recently examined, two-thirds appear to have been written by voodoo worshippers. From a still larger number of volumes on biology, chemistry, physics, and their applications, I find less than half a dozen which give the impression that the authors are acquainted with their subjects. Yet if one were to believe the high-voltage "blurbs" written by the publishers, this scivenering is serious stuff, indited by the world's most celebrated thinkers.

The truth is, an accurate tally would probably show only a moderate increase in the circulation of really authoritative works of a graver character. It is better so, if the choice to be between the high-grade fiction now appearing in this country and appeals to the higher cerebral centers by ignoramuses and confidence men. On the other hand, there is a plenteous supply of informative, thoughtful books written by master hands, and there is a demand as evidenced by the sale of the sludge mentioned above. Why do the two so seldom meet? I suspect that it is the fault of the publishers. The old conservative houses, with long lists of books having solid worth, fail to advertise them; the mass production firms are inveigled into pushing nonsense forward as gospel because their mentors on science and the like, if any, seldom are able to distinguish between an Isaac Newton and an Adolphus Mutt.

Science News-Letter, November 3, 1928

Star Life

Astronomy

(Dr. Harlow Shapley, of Harvard, says that stars are kept going by having comets and meteors fall into them.)

A. W. B. in the *London Daily Chronicle*, referring to discoveries first announced by Science Service (*SCIENCE NEWS-LETTER*, June 9, 1928):

My days are filled with peace,
For gone my apprehension is
Lest suns and worlds and stars should cease,

Since Shapley's intervention is
As full of Hope as aught can be
Of astral immortality.

Stars faded, said our fears,
With terrible velocity;
A hundred million million years,
Our utmost generosity
Could give them as the little span
Through which to cheer the eyes of man.

But, with celestial food,
We learn that stars are dieted,
And all timidity of mood
Henceforward has been quieted,
For stars may twinkle on, and grow
A trillion trillion years or so.

Science News-Letter, November 3, 1928

The mass of the earth is 81 times that of the moon.

the work of later reigns or later dynasties. Hetepheres I had been dead nearly fifteen centuries before the first tomb was cut in the Valley of the Kings. In her day, Egyptian culture was still a creative force, and the powers of its craftsmen, in particular the masons and sculptors, were only approaching their culmination. It was an age marked by common-sense materialism and high technical skill whose source rose in the dim past of the neolithic age, but a time when the greatness of Egypt lay unknown in the future. Men, whether at court or in the fields, went about their individual concerns scheming and planning as in all ages, unconscious of that which was to be, the accumulated result of all their lives.

Science News-Letter, November 3, 1928

The Peril of Behaviorism

Philosophy

Sir PHILIP GIBBS, in *The Day After Tomorrow* (Doubleday, Doran).

Unfortunately, this philosophy of "Behaviorism" is creeping into other countries, and a friend of mine recently was horrified to hear it expounded to a group of young men in Hyde Park on a Sunday morning. There will be no hope for the world if that school of thought prevails.

Science News-Letter, November 3, 1928

FIRST GLANCES AT NEW BOOKS

THE TWO SOLAR FAMILIES—T. C. Chamberlin—*University of Chicago Press* (\$2.50). One solar family includes the planets, asteroids and their satellites; the other consists of the comets, chondrulites and meteors. But though the sun was the mother of both, the two families had different fathers. The father of the planetary family was the passing star that pulled out the embryonic planets from the sun; the father of the cometary family was the starry host outside the solar system. This is the thesis developed by the distinguished professor emeritus of geology and paleontology of the University of Chicago and co-originator of the Moulton-Chamberlin theory in his latest work.

Astronomy

Science News-Letter, November 3, 1928

THE NEW WORLD—Isaiah Bowman—*World Book Co.* (\$4.80). This is an indispensable book for school, public and reference libraries. For it is the only volume that gives in readable form an account of the changes made by the Great War and of the present condition of all countries. It now appears in the fourth edition since its first publication in 1921, completely revised, considerably rewritten and enlarged by 75 pages and 42 new maps. Significant changes have been made in the chapters on the Mohammedan world, the mandated territories, the Soviet republics, Hungary, Yugoslavia and the commercial relations of the United States.

Geography

Science News-Letter, November 3, 1928

A SHORTER PHYSICAL GEOGRAPHY—Emmanuel de Martonne—*Knopf*. The translator of this leading French text, E. D. Laborde, points out in a foreword that it differs from usual English texts "in the absence of overmuch geology and physics." The author's method is a synthetic one; he builds up geographical principles by examining typical regions. Some of the charts have been especially prepared for this English edition.

Physiography

Science News-Letter, November 3, 1928

BLASTERS' HANDBOOK—Arthur LaMotte—*E. I. du Pont de Nemours & Co.* If you want to blast anything, from a tree trunk to a mountain, this little book will be useful to you.

Chemistry

Science News-Letter, November 3, 1928

LECTURES IN PSYCHIATRY—William A. White—*Nervous and Mental Disease Pub. Co.* Reading this book, you forget that you are dealing merely with printed words. Dr. White takes his readers with him, like a class, into a psychiatric clinic. Each patient is brought in, and very briefly described, so that he or she stands before you, a character. Then the psychiatrist lectures in informal fashion on the points that the case illustrates. In the hands of this well-known authority on mental disease the method is highly effective. The book confines itself to the major psychoses.

Psychiatry

Science News-Letter, November 3, 1928

THE CAVE MAN'S LEGACY—E. Hantbury Hankin—*Dutton* (\$2). The cave man's legacy is his addiction to blood-thirstiness, human sacrifice, murder, and other forms of violence, and needless to say, cave man traces can be found cropping out in the world today. Mr. Hankin's contention is that cave man's influence is waning, and that these traits were not a heritage from distant animal ancestors but were due rather to temporary and exceptional conditions that occurred in an early stage of evolution. The book abounds in illustrations from primitive tribes, ancient civilizations, and even from the French Revolution and, in contrast, the American Revolution.

Ethnology

Science News-Letter, November 3, 1928

THE NEW MORALITY—Durant Drake—*Macmillan* (\$2.50). What is necessary and desirable in standards of morality is at last coming to be judged by the scientific method of observing results. Handling the subject from this angle, Prof. Drake takes a keen look into such moral problems as corrupt politics, poisoned journalism, crime, race prejudice, irresponsible parenthood, and suppression of opinion. After looking at the picture from one angle and then another, he sums up our moral situation and indicates possibilities for bettering matters through eugenics, euthenics, and education.

Philosophy—Sociology

Science News-Letter, November 3, 1928

ARITHMETIC OF PHARMACY—A. B. Stevens—*Van Nostrand* (\$2). An exercise book for pharmacy students.

Pharmacy

Science News-Letter, November 3, 1928

HARVEY BAUM: A STUDY OF THE AGRICULTURAL REVOLUTION—E. S. Mead and B. Ostrolenk—*Univ. of Pennsylvania Press* (\$2). A study in economic self-help for farmers, dramatized by the story of what one Pennsylvania farmer did for himself.

Agriculture

Science News-Letter, November 3, 1928

THE PROTECTION FORESTS OF THE MISSISSIPPI RIVER WATERSHED AND THEIR PART IN FLOOD PREVENTION—E. A. Sherman—*Govt. Printing Office*. A condensed summary of our present knowledge of the role of the forests in the drainage of our great central valley.

Forestry—Physiography

Science News-Letter, November 3, 1928

WILD LIFE AND FOREST SURVEY OF SOUTHWESTERN CATTARAUGUS COUNTY, N. Y.—V. H. Calahane and W. A. Dence—*Roosevelt Wild Life Bulletin* (\$1). A biological survey of an interesting area in southern New York State.

Natural History

Science News-Letter, November 3, 1928

OUR NATIONAL PARKS, 2 VOLS.—Mary A. Rolfe—*Sanborn* (\$1.00 a volume). The national parks have been "done" for adults from almost every conceivable angle; the park bibliography fills pages. For children, however, little has been written on these marvelous areas, which of all places should be made plain for wondering eyes and minds not hardened as yet to miracles. Miss Rolfe, therefore, has done a high service in preparing these two books especially for young people. She adopts the best possible method for her exposition, in making a story of the adventures of imaginary children in the parks and in enlivening her text with many excursions into interesting anecdote.

Natural History

Science News-Letter, November 3, 1928

THE LIFE OF SIR MARTIN FROBISHER—William McFee—*Harper's* (\$4). The stirring life and adventures of the great English seaman who was defeated of the Northwest Passage, but took it out on the Spaniards in Armada days. Of his contemporaries, the author gives Sir Thomas Howard a good quittance, Sir Francis Drake a rather poor one, and Her Most Gracious Majesty Queen Elizabeth a very bad one, indeed.

Exploration—History

Science News-Letter, November 3, 1928

First Glances At New Books—Continued

HENRI BERGSON—Jacques Chevalier—*Macmillan* (\$2.50). Bergson's "Creative Evolution" presented a new conception of the universe which has widely influenced modern thought since its publication in 1910. It was obvious that such a novel view must have important bearings upon religion and ethics, yet Bergson himself has scrupulously refrained from deducing these. So various of his contemporaries have undertaken the task. Here the Professor of Philosophy in the University of Grenoble draws from the works of the Jewish philosopher a theology that is sufficiently orthodox to satisfy a Catholic Schoolman. The author endeavors to clear up the misunderstanding between Einstein and Bergson.

Philosophy

Science News-Letter, November 3, 1928

THE CREATIVE INTELLIGENCE AND MODERN LIFE—By Francis John McConnell, Frederick J. E. Woodbridge, Roscoe Pound, Lorado Taft, Robert A. Millikan, Paul Shorey—*University of Colorado* (\$2.00). Worth-while addresses by six specialists who discuss modern living in relation to religion, philosophy, the social order, art, science, and literature. The volume is the fifth, and last, of the University's Semi-Centennial Publications.

Philosophy

Science News-Letter, November 3, 1928

THE YOUNG CHILD—Bird T. Baldwin—*American Library Association* (35c.) (Reading with a Purpose Series). The vital interest in the heart of every family—the care of the young child—is covered thoroughly and sympathetically. Dr. Baldwin states: "Neither . . . colleges, finishing schools nor high schools have been concerned with giving even a six month training course for parenthood. . . . A child may be handicapped for life because of improper care, or he may be safeguarded by proper precautions during the first critical years." A list of supplementary readings on child study is appended.

Psychology

Science News-Letter, November 3, 1928

YEARBOOK ON COAL MINE MECHANIZATION—G. B. Southward—*American Mining Congress*. A report which details the progress made in applying machinery to the mining of coal.

Mining

Science News-Letter, November 3, 1928

THE GRAPHIC BIBLE—Lewis Browne—*Macmillan* (\$2.50). The delightful combination of romance and reality which makes the oldest maps so fascinating has been captured for this map-story of the Bible. Dragons with curly tails swim in the Great Sea. "Ur of the Chaldees, where Abraham was born," is not only labeled, but has a tent and a couple of palm trees, and its position as relating to the Tigris and Euphrates is clearly seen. Philistine and Israelite camps are drawn so that strategic problems can be visualized, and Moabites, Assyrians, and Ammonites are given a definite habitation in their corners of the eastern world. There is a map on practically every one of the 145 pages. The text carries along the Bible story in simple, modern English.

Geography—History

Science News-Letter, November 3, 1928

AN INTRODUCTION TO BIBLICAL ARCHAEOLOGY—George S. Duncan—*Revell* (\$1.75). The general idea that archaeology is shedding much new light on the Bible is familiar to the public. But Dr. Duncan, Egyptologist, is the first to pack the new knowledge into a small clearly written book so that the layman can see the situation from various angles. Dealing with the old, well-known names and places—Sinai, Antioch, the Tower of Babel, the Canaanites, and the rest—the author presents the "news" that has been revealed by pick and spade expeditions, and shows that the main positions of progressive Bible critics are in harmony with the conclusions of Biblical archaeologists. The subtitle of the book, "A textbook for school and home," indicates its range of usefulness.

Archæology

Science News-Letter, November 3, 1928

ANCIENT MAN—Richard Swann Lull—*Doubleday, Doran* (\$1.50). References to Pithecanthropus, Heidelberg Man, Rhodesian Man, and other fragmentary individuals occur frequently in the news, but there are undoubtedly many readers whose ideas of these far-away times and people remain disconnected and hazy. Prof. Lull fills in the gaps of background knowledge about the famous relics of prehistoric man and also gives a compact explanation of the life and manners in the various stages of prehistory.

Anthropology

Science News-Letter, November 3, 1928

HOWS AND WHYS OF COOKING—E. G. Halliday and I. T. Noble—*University of Chicago Press* (\$2). Even fudge making has a scientific method, and when one understands that this delectable confection is a structure of delicate crystals, whose size and shape may be greatly changed by agitation while cooling, one begins to understand why the usual methods of making it, including vigorous beating of the hot mass until it stiffens, are so often unsuccessful. The explanation and the scientific method are told simply and agreeably not only for candy but for all kinds of food except meat and jellies. In this book is help for the inexperienced bride and for the older housewife who still has failures which ordinary cookbooks do not explain or safeguard against. The book should also appeal to the general public, who often wonder why cooked vegetables are brownish gray instead of green or red, bread is crumbly, angel food leathery and why the house smells to high Heaven when cabbage is being cooked.

Home Economics

Science News-Letter, November 3, 1928

THE CRYPTOGRAM BOOK—Prosper Buranelli, F. G. Hartswick and Margaret Petherbridge—*Simon and Schuster* (\$1.90). All about ciphers and how to solve them, with numerous examples, the answers to which are given in the back, as well as comments on how to go about deciphering them. The authors and publishers believe that it will prove a successor in popularity to the cross-word puzzles. In view of the uncertain whims which public interest follows, time alone will tell whether or not they are justified. But in the meantime the puzzle addict will get some fun out of it.

Cryptography

Science News-Letter, November 3, 1928

ENGINEERS—Directory of Engineers of Corporations—*Neo-Techmi Research Corp.* (\$25). The legion that never was listed, those civil, mechanical, electrical, mining and metallurgical engineers and concerns that build the man-made world, gather on the 1321 pages of this large volume. In addition to the prodigious number of listings, it contains engineering data such as found in handbooks and texts.

Engineering

Science News-Letter, November 3, 1928

Measures Paint Color

Physics

Hit and miss methods of mixing paints will soon be replaced by mathematical methods when the results of an investigation into the strength of pigments used in making tints completed by the U. S. Bureau of Standards are put into practical use.

The Bureau has measured with the spectrophotometer the color value of 104 different mixtures of pigments combined with a standard color.

The investigation has disclosed the exact strength and amount of a pigment that should be mixed with a standard color to bring a given result. The investigation is hoped to result in a numerical color value being given to each pigment instead of the mixture depending on more or less uncertain methods of comparing shades.

Science News-Letter, November 3, 1928

Carbohydrates and Colds

Physiology

The old adage, "Feed a cold but starve a fever," needs amending. The kinds of food you eat are now considered important as well as the amount and may have a definite effect on the number of colds you have this winter. A diet that is low in sugar and starch proved successful in keeping one susceptible subject from having any colds at all as long as the diet was adhered to, according to a report in *Science* by Frederick Hoelzel of the University of Chicago.

Mr. Hoelzel, who has been an extremely frequent sufferer from colds all his life, discovered in the course of experimental work that he had no colds at all when he fasted. Further experiments with various diets showed that while colds were numerous on vegetarian diets and on diets containing large amounts of sugar and starches, when the diet contained no more than 500 calories of sugars and starches in a daily

total of 2,500 calories, ordinary colds did not develop. At the same time the protein intake must be adequate.

The explanation of this lies, Mr. Hoelzel believes, in some as yet undetermined relation between the amount of fluid in the body's tissues and their sensitiveness. A considerable amount of water is stored in the body with carbohydrates or starches and sugar. When the carbohydrate intake is lowered, the amount of it and of water stored is lessened, and, according to Mr. Hoelzel's theory, the sensitiveness of the tissues is also lessened, so that a cool breeze or exposure to damp chilly weather will not be so apt to result in a cold.

It may be that the comparative freedom from colds in Arctic regions depends more on the Arctic diet, high in meat and low in sugar and starch, than on the cold weather or the absence of germs.

Science News-Letter, November 3, 1928

To Study Mountains in Making

Geology

By W. A. J. M. van WATERSCHOOT
VAN DER GRACHT

A great mountain system, now slowly forming under the waters of tropic seas, whose peaks and partially emerged ranges are now known as the East Indies, is to be the object of study by a Dutch scientific expedition now about to take the field.

The eastern portion of the East Indian Archipelago is a region which is probably more subject to present-day diastrophism than any other area on the earth. The sea bottom between Borneo, New Guinea, and the Australian shelf is different from any other, not even excluding the West Indies. It is an area of most marked unrest, studded with islands and active volcanoes, arranged in an intricate system of looped arches encircling deep basins. Coral reefs, which can only live and grow within a few feet of the surface, indicate that this entire region is subject to continuous changes of level, amounting to not less than 3000 feet, plus or minus, for reefs with a present or almost present day fauna. Such reefs are now being found either elevated to such altitudes above the present sea-level, or submerged to corresponding depths. The fringes of old reef terraces on the Moluccan islands prove

that we have not only vertical changes of level, but regular folds expressed in strongly tilted shore reefs.

These conditions make the Moluccan Archipelago a region of exceptional interest for oceanographic, biological and geologic research. The very pronounced relief of the sea bottom and the occurrence of a number of individual deep basins, separated from the open ocean by shallower sills, cause a complicated subsurface circulation of water and anomalies as to deep-sea temperatures, chemical constitution and food supply of the water, which influence life in these deep basins in a peculiar manner. All this is of the greatest interest to the oceanographer, the zoologist and the geologist.

It is the general opinion among geologists that we are witnessing here a truly Alpine chain of mountains actually in the making: a product of the violent compression of a wide region between the continental masses of Australia (including New Guinea), and of southern Asia (including Borneo). The present sea bottom and the topography of the islands are the surface expression of the mountain folds (and possibly overthrusts) at the time of their formation. What we can now observe in the strata of

the Tertiary mountain chains of the earth, the Alps and others, and of course still more in older mesozoic or palaeozoic mountains, are the folds and thrusts which at the time of their formation were buried miles below the surface and have since been laid bare by erosion of the later emerged chain. What the surface of the young, then mostly submarine chain may have been like, when it was forming, can only be guessed at by attempts at reconstruction of the eroded strata. In the Moluccas we have now the means to observe actual happenings of this nature. But, being largely submarine, we need the oceanographer to give us the accurate picture.

Physical and biological conditions in these isolated deep basins in the ocean floor, subject to active sedimentation of erosional and organic products from the numerous tropical islands, are very different from those in the open ocean, and of the greatest interest for the interpretation of the rocks which we find in the mountains of former geological periods, whose conditions of their deposition must have been very similar.

Past oceanographic expeditions have largely confined themselves to the open ocean and have (*Turn to next page*)

Egypt Dead and Alive

Archæology

JEAN CAPART, in *Lectures on Egyptian Art* (University of North Carolina Press):

Let us begin with their architecture. At once the idea of the colossal comes to our minds. We think of the pyramids, of the temples with their obelisks and their gigantic statues; we see the hypostyle halls with columns and architraves, the proportions of which surpass what has been executed in other countries. Assuredly, the idea of their constructors was to consecrate to the gods "Temples of Eternity"—as the texts say—capable of resisting all causes of destruction. Nevertheless—let us not forget this—these are but transpositions into stone of architectural forms realized in other materials for the houses and the palaces. Here it was granite, sandstone, limestone; there it was brick and wood which constituted the elements the architects combined. The misfortune is that they did not seek to create two distinct types of architecture to correspond to the essentially different characters of the materials they utilized.

To a considerable extent, the stone monuments are but the translation,

heavy and strained, of constructions destined for the living, which, being ephemeral, could not have sufficed to lodge the gods and the dead whose existence was to be eternal. The unbaked bricks have gone back to the earth; the wood has disappeared through the action of time, of men, and even of ants. Once only, for the town of Tell el-Amarna, have special circumstances preserved the remains of habitations sufficient to allow of our studying the plan and making restorations in which fancy has no share.

These houses were constructed in the middle of large and beautiful gardens, with ponds and pleasure pavilions; the outbuildings, which included the warehouses, the work-shops, the granaries, and the servants' quarters, were grouped separately. For the master's dwelling a type had been adopted, which, frequently repeated with slight variations, had become the classical model of a comfortable residence.

If we glance at a plan, we shall be struck by its clearness, to a certain extent modern. The house with its verandas, its central hall, its suites of

rooms in which a bathroom is generally included; all that is well conceived and could still be used nowadays. The restorations of the hall, whether they be made by a German or an English archaeologist, are practically identical. They give an impression of airiness and gaiety very different from the feeling one experiences in the hypostyle halls of the temples, the columns of which thickset and crowded, left insufficient space between them. The doors which led from the hall into the principal rooms were often ornamented with open-work designs of which we have happily faithful copies sculptured in the stone of the tombs. In the upper part, carved ornamentations combined different designs: falcons' heads, tufts of papyrus, protective amulets, little columns; sometimes, but more rarely, figures of sphinxes or cats; the whole mixed with hieroglyphic inscriptions. The simplicity of the plan of these houses at once reveals a veritable science of architecture in a country where dwellings, long since, had passed beyond the stage of merely utilitarian construction.

Science News-Letter, November 3, 1928

Study Mountains In the Making—Continued

scarcely touched the East Indies. The only exception of note is the important Dutch Siboga expedition of 1899, the object of which was largely zoological. The number of existing off-shore soundings is still very small for a region with such intricate relief. This becomes very clear if we compare the area with any mountainous district on land. It would be as if the relief of the Alps in Switzerland were known from only 40 to 50 date levels!

A new oceanographic expedition in the Moluccan seas is now in preparation under Commander P. M. van Riel, chief of the Oceanographic Section of the Netherlands Meteorological Institute at De Bilt, near Utrecht, with the support of the Home and Colonial Governments and several institutions and individuals. The funds have been secured to a sufficient amount to permit about 15 months of active work. The expedition is to leave early in 1929. It will use a newly launched surveying vessel of the Dutch Government, the "Willibrord Snellius".

In addition to an extensive program of physical, chemical and biological

research, particular stress will be laid on the configuration of the bottom and the sediments now being deposited there. In addition to the latest oceanographic sounding and sampling equipment and the biological outfit, the vessel will carry sonic sounding apparatus with which it is expected to make at least 10,000 new depth determinations, in order to obtain a reliable and fairly detailed map of the submarine topography of this most interesting region. It is planned that a submarine of the Dutch Navy will cooperate with the expedition, in order to make gravity observations at sea by the method developed by Prof. Vening Meinesz.

A geologist, Dr. Ph. H. Kuenen of Leiden, is added to the staff to assist in these observations, which promise to become of such paramount interest for the study of structural and sedimentary geology. Dr. H. Boschma will give special attention to the plankton in these regions and its relations to the bottom sediments.

The leader of the expedition and Dr. Kuenen have promised to cooperate with the committee in charge

of Project No. 4 of the research work undertaken by the American Petroleum Institute: the study of present-day sediments which can be considered as future source rocks of petroleum now being deposited. The members of this committee are Alex W. McCoy, Austin H. Clark, T. Wayland Vaughan, S. A. Waksman and W. A. J. M. van Waterschoot van der Gracht; research fellow is Parker D. Trask, assisted by C. C. Wu. The Moluccan seas, constituting a tropical region subject to both active sedimentation and contemporaneous diastrophism, is of the greatest possible interest for this research. Dr. Trask will cooperate with Dr. Kuenen in the study of the samples of bottom sediments to be taken by the expedition. Their organic contents and other characteristics of interest for the study of the genesis of petroleum will be determined. This promises to be a most valuable contribution to the work already performed by the committee around the North American continent and in the seas of Central America and Northern South America.

Science News-Letter, November 3, 1928